INERTIAL CONFINEMENT FUSION

Lawrence Livermore National Laboratory

Monthly Highlights

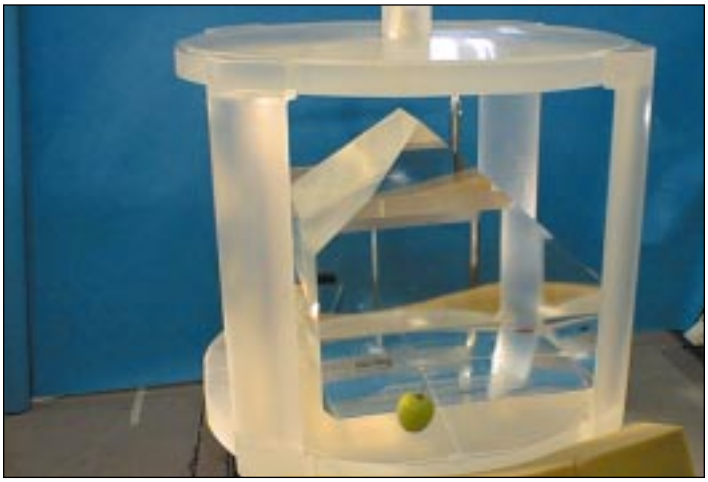
October 1998

UCRL-TB-128550-99-1

Target Assembly Building Outer Wall Pour. The NIF Target Area Building's outer wall pour began with a 14-hour, 2,500-cubic-yard, monolithic pour on October 16 and 17. This section of the wall is 12 feet thick, and ranges from –21'9" to –4'6" (i.e., below ground level). This first major pour for the Target Area Building cylinder will be followed by additional pours, finishing at +86' (above ground level).

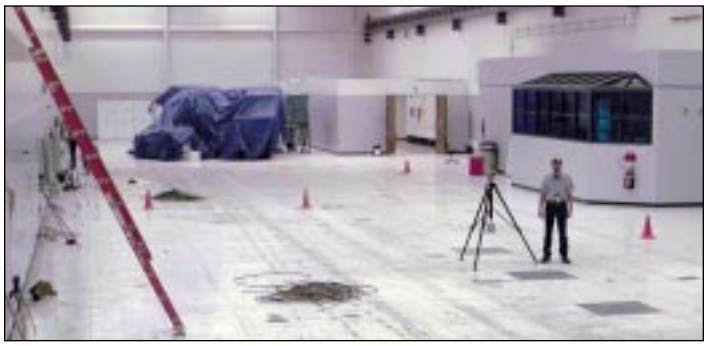
The first major Target Area Building outer-wall-cylinder monolithic pour is complete.

DKDP Growth Milestone. Large deuterated potassium dihydrogen phosphate (DKDP) crystal plates will be used on NIF to mix infrared and green laser light to the ultra-violet light needed for optimum capsule implosions. The first ever NIF-sized boule of DKDP, measuring 55 cm in each direction, was recently grown. This boule will yield about 17 conversion plates.



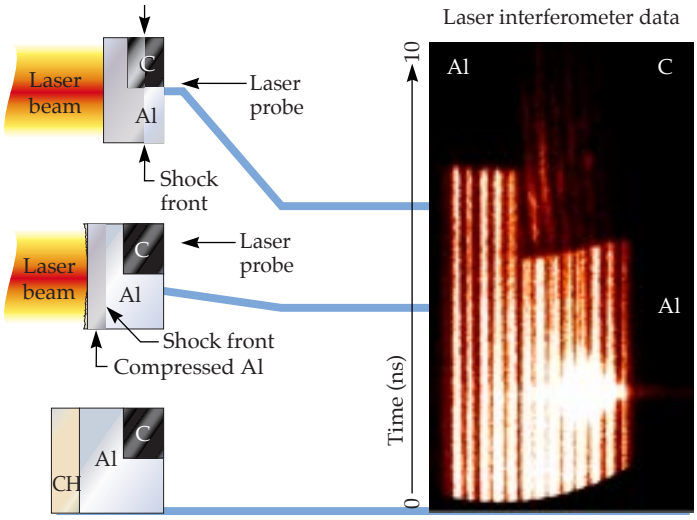
The NIF-sized DKDP crystal will yield about 17 conversion plates.

Beamlet Laser. The Beamlet laser has been removed from the LLNL high bay in Bldg. 381 and shipped to Sandia, Albuquerque, for use as a laser backlighter on their Z accelerator facility. The Bldg. 381 high bay is now ready for renovation by Dome Construction Company. The first use will be for NIF amplifier frame assembly.



The Beamlet high bay is now ready for conversion.

Nova Experiments Show Diamond Phase Change. We use VISAR (velocity interferometer system for any reflector) to measure the single-shock equation of state (EOS) and shock-compressed reflectivity of diamond (C). As shown below, the target design is a stepped aluminum (Al) witness plate with a CH ablator and diamond glued onto a thin Al step. Also shown below is the VISAR signal. The bright vertical lines are VISAR fringes from the motionless Al. The weaker, shifted fringes are from the moving shock front in C as the diamond undergoes a phase change from insulator to metal. Similar phase changes have been observed in lithium fluoride.



Nova experiments show the insulator–metal transition on the Hugoniot of diamond.

For comments about content of the *Monthly Highlights*, contact Bob Kauffman (925) 422-0419.
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These reports and other LLNL ICF Program information are available on our Web page at http://lasers.llnl.gov/lasers/inertial.html
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